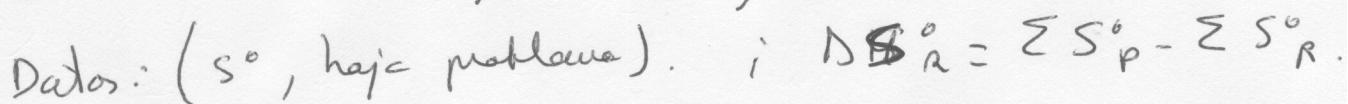
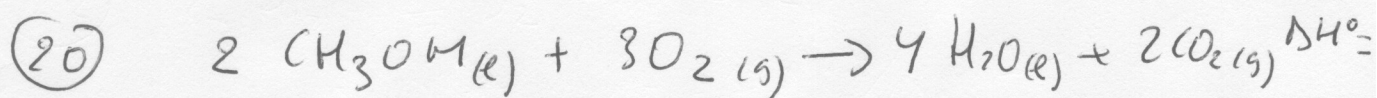


$$\Delta H_R^\circ = \sum H_P^\circ - \sum H_R^\circ$$

$$-1409 = [2(-349) + 2(-286)] - [X + 0]$$

$$X = \Delta H_f^\circ C_2H_4 = 139 \text{ kJ/mol} > 0 \quad \text{Endotérmico}$$



$$\Delta S_R^\circ = [4 \cdot 70'0 + 2 \cdot 213'7] - [2 \cdot 126'8 + 3 \cdot 205] =$$

$$= -161'2 \frac{J}{K} = -0'161 \text{ kJ/K}$$

$$\Delta G^\circ = \Delta H^\circ - T \Delta S^\circ$$

$$\Delta G^\circ = -1552'8 \text{ kJ} - 298 \text{ K} \cdot (-0'161 \text{ kJ/K}) =$$

$$= -1504'8 \text{ kJ} < 0 \quad ; \quad \text{Exotérmico}$$